Amendments to the Claims

This listing of claims will replace all prior versions, and listings, of claims in the application.

Listing of Claims:

1. (Currently Amended) A filter for filtering, sterilizing, and decomposing organic matter, said filter composed of a porous semiconductor device, comprising:

a porous substrate having continuous pores; and

a porous semiconductor layer having a light emitting property by electroluminescence, cathode luminescence, or photoluminescence, and having continuous pores,

wherein the porous substrate is a porous ceramic or a metal having continuous pores,

said porous semiconductor layer is provided in an interior or on a surface of the substrate, and

the porous semiconductor layer comprises a material selected from a group consisting of GaN, AlN, ZnO, ZnF_2 [[ZnF2]], [[and]] diamond, Ga-Al-N mixed crystals, ZnS, CdS, ZnSe, ZnF_2:Gd, AlN:Gd, diamond:Gd, and CaF_2:Gd.

2. (Previously presented) A filter according to Claim 1, wherein the porous semiconductor layer having a property of emitting ultraviolet light with a wavelength of 400 nm or less.

3. (Previously presented) A filter according to Claim 2, wherein the ultraviolet light has a wavelength in a range of 227 to 400 nm.

4. (Previously presented) A filter according to Claim 3, wherein the ultraviolet light has a wavelength in a range of 230 to 270 nm.

5. (Previously presented) A filter according to Claim 1, wherein the semiconductor layer has a pn junction structure.

6. (Previously presented) A filter according to Claim 1, wherein a porosity of the semiconductor layer is at least 30%.

7. (Previously presented) A filter according to Claim 1, wherein an average pore size of the porous substrate and/or the porous semiconductor layer is from 0.0003 to 100 μm.

8. (Previously presented) A filter according to Claim 1, wherein an insulating layer is formed on a front and/or a back surface of the semiconductor layer.

9. (Previously presented) A filter according to Claim 8, wherein the insulating layer is formed from a material having a photocatalytic function.

10. (Previously presented) A filter according to Claim 1, wherein the semiconductor layer is made up of crystal particles, and a surface of these crystal particles is coated with particles having a photocatalytic function.

11. (Cancelled)

12. (Cancelled)

13. (Previously presented) A filter according to Claim 1, wherein a porosity of the porous substrate is at least 30%.

14. (Previously presented) A filter according to Claim 1, wherein a thickness of the porous semiconductor layer disposed on the surface of the porous substrate is from 1 to 1000 μm.

15. (Previously presented) A filter according to Claim 1, wherein an average pore size of the porous substrate is from 0.01 to 1000 μm.

16. (Currently Amended) A porous semiconductor device for filtering, sterilizing, and decomposing organic matter, said porous semiconductor device comprising:

a porous substrate having continuous pores; and

a porous semiconductor layer having a light emitting property by electroluminescence, cathode luminescence, or photoluminescence, and having continuous pores;

wherein the porous semiconductor layer is formed by depositing semiconductor particles having a light emitting property on a surface of the porous substrate, and having a particle diameter of 0.01 to 5 μm, and

said semiconductor particles having the light emitting property comprising a material selected from a group consisting of GaN, AlN, ZnO, ZnF_2, [[and]] diamond, Ga-Al-N mixed crystals, ZnS, CdS, ZnSe, ZnF_2:Gd, AlN:Gd, diamond:Gd, and CaF_2:Gd.

17. (Previously presented) A porous semiconductor device according to Claim 16, wherein the pores in the porous substrate are through-holes perpendicular to a substrate plane.

18. (Previously presented) A porous semiconductor device according to Claim 16, wherein an average pore size of the porous substrate is from 0.1 to 100 μm.

19. (Previously presented) A porous semiconductor device according to Claim 16, wherein a pn junction is formed in a lengthwise direction of the columns.

20. (Previously presented) A porous semiconductor device according to Claim 16, wherein the columns comprising a base component and a pointed component located on the distal end of this base component.

21. (Previously presented) A porous semiconductor device according to Claim 16, wherein an electroconductive porous film is disposed as an electrode at the distal ends of the columns, and another electroconductive porous film is disposed as an electrode on an opposite surface of the porous substrate from the surface where the columns are formed.

22. (Previously presented) A porous semiconductor device according to Claim 16, wherein an electroconductive porous film is disposed as one electrode at the distal ends of the columns, and the porous substrate comprises an electroconductive material and constitutes another electrode.

23. (Previously presented) A porous semiconductor device according to Claim 21 or 22, wherein a surface of the columns and/or a column-side surface of the electrode disposed at the distal ends of the columns is coated with particles having a photocatalytic function.

24. (Previously presented) A filter that makes use of the porous semiconductor device according to Claim 16.

25. (Currently Amended) A porous semiconductor device for filtering, sterilizing and decomposing organic matter, said porous semiconductor device comprising:

a porous substrate having continuous pores;

a porous semiconductor layer having a light emitting property by electroluminescence, cathode luminescence, or photoluminescence, and having continuous pores,

wherein the porous semiconductor layer comprises deposited semiconductor particles having a light emitting function on a surface of the porous substrate, and

having a particle diameter of 0.01 to 5 μm, and

said semiconductor particles having the light emitting property comprises a material selected from a group consisting of GaN, AlN, ZnO, ZnF_2, [[and]] diamond, Ga-Al-N mixed crystals, ZnS, CdS, ZnSe, ZnF_2:Gd, AlN:Gd, diamond:Gd, and CaF_2:Gd.

26. (Previously presented) A porous semiconductor device according to Claim 16, wherein said porous semiconductor device comprises an electrode for injecting current into the porous semiconductor layer.

27. (Previously presented) A porous semiconductor device according to Claim 25, wherein the porous semiconductor layer comprises a deposited layer of p-type semiconductor particles and a deposited layer of n-type semiconductor particles to form a pn junction.

28. (Previously presented) A porous semiconductor device according to Claim 25, wherein a surface of the semiconductor particles is coated with an insulating layer.

29. (Previously presented) A method for manufacturing a porous semiconductor device having a light emitting function and comprising a porous substrate having through-holes, and a porous semiconductor layer formed on a surface of this substrate, the method comprising at least steps of:

(a) preparing a porous substrate and at least one of semiconductor particles having a light emitting function that works by electroluminescence, cathode luminescence, or photoluminescence;

(b) producing a suspension of the semiconductor particles; and

(c) filtering the suspension through the porous substrate, thereby forming a deposited layer comprising semiconductor particles on the surface of the porous substrate.

30. (Previously presented) A method for manufacturing a porous semiconductor device according to Claim 29, further comprising a step of forming an electrode for injecting current into the deposited layer.

31. (Previously presented) A method for manufacturing a porous semiconductor device according to Claim 29, further comprising a step of performing a treatment for bonding together the individual semiconductor particles that form the deposited layer, after the step (c) .

32. (Previously presented) A method for manufacturing a porous semiconductor device according to Claim 31, wherein the treatment is a heat treatment.

33. (Previously presented) A method for manufacturing a porous semiconductor device according to Claim 31, wherein the treatment is a treatment in which a semiconductor material is deposited in the vapor phase at the contact portions between the semiconductor particles.

34. (Previously presented) A method for manufacturing a porous semiconductor device according to Claim 29, comprising a step of coating a surface of the semiconductor particles with an insulating layer or a material having a photocatalytic function, between the steps (a) and (b).

35. (Previously presented) A method for manufacturing a porous semiconductor device according to Claim 29, wherein a step of coating a porous substrate surface with an

insulating layer is added before the step (c), and a step of coating the surface of the deposited layer with an insulating layer is added after the step (c).

36. (Previously presented) A method for manufacturing a porous semiconductor device according to Claim 29, wherein in the step (b), at least one of suspension of p-type semiconductor particles and at least one of suspension of n-type semiconductor particles are prepared, and in the step (c), these suspensions are alternately filtered through the porous substrate to form a deposited layer with a pn junction structure.

37. (Previously presented) A method for manufacturing a porous semiconductor device according to Claim 29, wherein an average size of the semiconductor particles is from 0.01 to 5 μm.

38. (Previously presented) A filter composed of the porous semiconductor device according to Claim 25.

39. (Currently Amended) A porous semiconductor device for filtering, sterilizing and decomposing organic matter, the porous semiconductor device comprising:

a porous substrate having continuous pores; and

a porous semiconductor layer having a light emitting property by electroluminescence, cathode luminescence, or photoluminescence, and having continuous pores,

wherein an electrode is formed on a top or bottom surface of the porous substrate, a porous insulating layer, a porous semiconductor layer, another porous insulating layer, and

another electrode are formed sequentially on the porous substrate, the porous semiconductor layer emits ultraviolet light by electroluminescence when AC voltage is applied between the electrodes, and the porous semiconductor layer has a bandgap of at least 3.2 eV and is doped with gadolinium, which is the light emitting center, and

the porous semiconductor layer comprises a material selected from a group consisting of GaN, AlN, ZnO, ZnF_2, [[and]] diamond, Ga-Al-N mixed crystals, ZnS, CdS, ZnSe, ZnF_2:Gd, AlN:Gd, diamond:Gd, and CaF_2:Gd.

40. (Previously presented) A porous semiconductor device for filtering, sterilizing and decomposing organic matter, the porous semiconductor device comprising:

a porous substrate having continuous pores; and

a porous semiconductor layer having a light emitting function that works by electroluminescence, cathode luminescence, or photoluminescence, and having continuous pores;

wherein an electrode is formed on a top or bottom surface of the porous substrate, the porous semiconductor layer is formed by dispersing semiconductor particles in an insulating layer, an electrode is formed on the porous semiconductor layer, the porous semiconductor layer emits ultraviolet light by electroluminescence when AC voltage is applied between the electrodes, and the semiconductor particles have a bandgap of at least 3.2 eV and are doped with gadolinium, which is the light emitting center.

41. (Previously presented) A porous semiconductor device according to Claim 39 or 40, wherein a surface of the porous insulating layer or of the porous semiconductor layer formed

by dispersing semiconductor particles in the insulating layer is covered by a porous layer having a photocatalytic function, or pore walls of the porous substrate are covered by a material having a photocatalytic function.

42. (Previously presented) A porous semiconductor device according to Claim 39 or 40, wherein the porous insulating layer or the insulating layer in which the semiconductor particles are dispersed is formed from a material having a photocatalytic function.

43. (Previously presented) A porous semiconductor device according to Claim 39 or 40, wherein the bandgap of the porous semiconductor layer or the semiconductor particles is at least 4.0 eV.

44. (Previously presented) A porous semiconductor device according to Claim 39 or 40, wherein either the electrodes are porous or the structure of the electrodes has a porous structure.

45. (Previously presented) A porous semiconductor device according to Claim 44, wherein the electrodes comprises a porous transparent electroconductive film.

46. (Previously presented) A method for manufacturing a porous semiconductor device in which a porous insulating layer, a porous semiconductor layer, and a porous insulating layer are laminated on a porous substrate having continuous pores and having an electrode formed on its top or bottom surface, and another electrode is formed on the top surface, the

porous semiconductor device emitting ultraviolet light by electroluminescence when AC voltage is applied between the electrodes, the method comprising at least steps of:

(a) preparing a suspension of gadolinium-doped semiconductor powder and a suspension of a insulator powder;

(b) filtering the suspension of a insulator powder through the porous substrate to deposit a porous insulating layer on the porous substrate surface;

(c) filtering the suspension of the semiconductor powder through the porous substrate to deposit a porous semiconductor layer on the insulating layer; and

(d) further filtering the suspension of the insulator powder through the porous substrate to deposit a porous insulating layer on the semiconductor layer.

47. (Previously presented) A method for manufacturing a porous semiconductor device in which a porous semiconductor layer comprising semiconductor particles dispersed in an insulating layer is formed on a porous substrate having continuous pores and having an electrode formed on its top or bottom surface, and another electrode is formed on the top surface, the porous semiconductor device emitting ultraviolet light by electroluminescence when AC voltage is applied between the electrodes, the method comprising at least steps of:

(a) preparing a gadolinium-doped semiconductor powder;

(b) covering the semiconductor powder with an insulating layer and preparing another suspension thereof; and

(c) filtering the suspension through the porous substrate to deposit a porous semiconductor layer on the porous substrate.

48. (Previously presented) A filter composed of the porous semiconductor device according to Claim 39 or 40.

49. (Previously presented) A bioreactor composed of the porous semiconductor device according to Claim 39 or 40.

50. (Previously presented) An ultraviolet light source that makes use of the porous semiconductor device according to Claim 39 or 40.

51. (Previously presented) A porous semiconductor device for filtering, sterilizing and decomposing organic matter, the porous semiconductor device comprising:

a porous substrate having continuous pores; and

a porous semiconductor layer having a light emitting function that works by electroluminescence, cathode luminescence, or photoluminescence, and having continuous pores,

wherein the porous semiconductor layer is made of porous silicon nitride comprising columnar Si_3N_4 particles with an average aspect ratio of at least 3 and an oxide-based binder phase containing at least one of rare earth element, and emits visible light or ultraviolet light.

52. (Previously presented) A porous semiconductor device according to Claim 51, wherein a surface of the columnar Si_3N_4 particles is covered with a film or particles having a photocatalytic function.

53. (Previously presented) A porous semiconductor device according to Claim 51, wherein a film or deposited layer of particles having a photocatalytic function is formed on a surface of the porous semiconductor layer.

54. (Previously presented) A porous semiconductor device according to Claim 51, which emits ultraviolet light having its peak wavelength in a range of at 300 to 320 nm.

55. (Previously presented) A porous semiconductor device according to Claim 51, containing at least gadolinium as the rare earth element.

56. (Previously presented) A porous semiconductor device according to Claim 55, further containing yttrium as the rare earth element.

57. (Previously presented) A porous semiconductor device according to Claim 51, wherein an average pore size of the porous semiconductor layer is from 0.1 to 5 μm.

58. (Previously presented) A porous semiconductor device according to Claim 51, wherein a three-point bending strength is at least 100 MPa.

59. (Previously presented) A light emitting device having the porous semiconductor device according to Claim 51.

60. (Previously presented) A filter that makes use of the porous semiconductor device according to Claim 51.

61. (Previously presented) A porous semiconductor device for filtering, sterilizing and decomposing organic matter, the porous semiconductor device comprising:

a porous substrate having continuous pores; and

a porous semiconductor layer having a light emitting function that works by electroluminescence, cathode luminescence, or photoluminescence, and having continuous pores,

wherein the porous substrate is columnar in shape and has formed therein in an axial direction a plurality of holes serving as passages for a fluid to be treated, the continuous pores lead from an inner wall of the holes to a side of the column, and the porous semiconductor layer is formed on the inner wall.

62. (Cancelled)